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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/519,947	12/29/2004	Mariette Andersson	12810-00141-US	5032

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EXAMINER	
KRUSE, DAVID H	

ART UNIT	PAPER NUMBER
1638	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/519,947	ANDERSSON ET AL.	
	Examiner	Art Unit	
	David H. Kruse	1638	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *16 July 2007*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-5 and 7-19* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-5 and 7-19* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

STATUS OF THE APPLICATION

1. This Office action is in response to the Amendment and Remarks filed on 16 July 2007.

2. The objections of record are withdrawn in view of Applicants' amendments to the specification and claims.

3. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claim Rejections - 35 USC § 102

4. Claims 1, 3-5, 8, 9, 13, 14 and 19 remain rejected under 35 U.S.C. § 102(b) as being anticipated by Bedbrook *et al* (U.S. Patent 5,414,870). This rejection is maintained for the reasons of record set forth in the Office action mailed 12 February 2007. Applicants' arguments have been fully considered but are not found to be persuasive.

Bedbrook *et al* disclose transforming plant cells with a vector comprising a nucleic acid fragment encoding an *Arabidopsis thaliana* AHAS promoter, coding region and terminator region (see figure 10) and selecting transformed cells resistant to an imidazolinone herbicide and regeneration of a transformed plant at columns 28-29. The disclosed nucleic acid fragment would hybridize to a complementary strand of the sequence of Applicants' SEQ ID NO: 1, and discloses an analogue or fragment of Applicants' SEQ ID NO: 1. Bedbrook *et al* discloses that the vector can also comprise a nucleic acid that encodes a gene of interest conferring some agronomically useful trait, which would inherently encode proteins and peptides at column 29, lines 1-5. Bedbrook

et al disclose that the use of potato is encompassed by the disclosed method of using said nucleic acid fragment at column 28, lines 20-31.

Applicants argue that Bedbrook discloses that the sequence depicted in Figure 10, as with other mutants, confers resistance to sulfonylurea herbicides but not to imidazolinone herbicides (see col. 20, lines 18-27). Applicants argue that Bedbrook does not disclose selecting for AHA synthase inhibitor resistant cells using an imidazolinone type herbicide as a selection agent. Applicants argue that the plasmid in Bedbrook contains a NPTII gene, which confers resistance to the antibiotic kanamycin. Applicants argue that Bedbrook does not disclose the mutant gene of the present invention depicted in SEQ ID NO: 1 and as such does not disclose a sequence which hybridizes to the complement of SEQ ID NO: 1 (pages 8 and 9 of the Remarks). These arguments are not found to be persuasive. At claim 1, Bedbrook discloses that the nucleic acid construct encodes a plant acetolactate synthase protein, which is resistant to imidazolinone herbicides. The nucleic acid encoding a plant acetolactate synthase protein disclosed by Bedbrook in Figure 10 is 99.9% identical to Applicants' SEQ ID NO: 1 from base 1979-4885, which the art would recognize as sufficient to hybridize to a complementary strand of Applicant's SEQ ID NO: 1.

Claim Rejections - 35 USC § 102/103

5. Claims 1-5, 7-9 and 13-19 remain rejected under 35 U.S.C. § 102(b) as anticipated by or, in the alternative, under 35 U.S.C. § 103(a) as obvious over Sathasivan *et al* (U.S. Patent 5,767,366). This rejection is maintained for the reasons of

record set forth in the Office action mailed 12 February 2007. Applicants' arguments have been fully considered but are not found to be persuasive.

Sathasivan *et al* disclose a vector comprising a DNA sequence encoding an *Arabidopsis thaliana* AHAS protein having an asparagine to serine mutation at amino acid 653, said AHAS protein being tolerant to imidazolinone herbicides (see claim 1 and column 7, 2nd paragraph). Sathasivan *et al* disclose a 5.8 kb DNA fragment that appears to have the sequence of Applicants' SEQ ID NO: 1, said fragment being of the same size and acknowledged by Applicants' as being used in the instant invention at page 11, 2nd paragraph of the instant specification. Sathasivan *et al* disclose transforming tobacco cells with said vector, selecting transformed cells with different concentrations of imazapyr, and regenerating transformed, imazapyr resistant whole plants (columns 13-14). The 5.8 kb DNA fragment disclosed by Sathasivan *et al* comprises the homologous promoter and termination regions. Sathasivan *et al* disclose transforming potatoes with said vector at column 9, line 4, hence inherently disclose potato plant cells, plants and harvest products comprising said DNA sequence. Sathasivan *et al* do not disclose using imazamox (instant claim 7) in the selection process, but imazamox would have been an obvious analogue of the imazapyr used by Sathasivan *et al* at column 14, 1st paragraph.

Applicants argue that Sathasivan teaches away from the present invention. Applicants argue that Sathasivan discloses that cloning the 5.8 kb fragment in the vector "proved difficult without the additional kanamycin selection marker (Kan)" (See Sathasivan col. 12, lines 58-60). Applicants argue that Sathasivan describes that the

"primary and secondary selection of transformants was based on the kanamycin resistance conferred expression vector by co-transformed NPTII gene" and that the herbicide "imazapyr was not used as the selection agent" (page 9, last paragraph of the Remarks). Applicants argue that because Sathasivan discloses that cloning the 5.8 kb fragment in the vector "proved difficult without the additional kanamycin selection marker (Kan)," Sathasivan does not teach transgenic potato plant cells, plants and harvest products produced by the method of the present invention that "does not comprise a gene conferring resistance to an antibiotic." (page 10, 2nd paragraph of the Remarks). These arguments are not found to be persuasive. As directed to claims 8, 9 and 13-19, the disclosure of Sathasivan anticipates these compositions, as the use of a kanamycin resistance selection marker would not obviate the instant rejection. As directed to claims 1-5 and 7, Sathasivan specifically discloses that the disclosed mutant gene can be used as a selection marker in plant transformation systems at column 15, lines12-15 and does not teach away from the claimed method.

Claim Rejections - 35 USC § 103

6. Claims 1-5 and 7-19 remain rejected under 35 U.S.C. § 103(a) as being unpatentable over Sathasivan *et al* (U.S. Patent 5,767,366) in view of Edwards *et al* (WO 99/06575). This rejection is maintained for the reasons of record set forth in the Office action mailed 12 February 2007. Applicants' arguments have been fully considered but are not found to be persuasive.

Sathasivan *et al* teach a vector comprising a DNA sequence encoding an *Arabidopsis thaliana* AHAS protein having an asparagine to serine mutation at amino

acid 653, said AHAS protein being tolerant to imidazolinone herbicides (see claim 1 and column 7, 2nd paragraph). Sathasivan *et al* teach a 5.8 kb DNA fragment that appears to have the sequence of Applicants' SEQ ID NO: 1, said fragment being of the same size and acknowledged by Applicants' as being used in the instant invention at page 11, 2nd paragraph of the instant specification. Sathasivan *et al* teach transforming tobacco cells with said vector, selecting transformed cells with different concentrations of imazapyr, and regenerating transformed, imazapyr resistant whole plants (columns 13-14). The 5.8 kb DNA fragment taught by Sathasivan *et al* comprises the homologous promoter and termination regions. Sathasivan *et al* teach transforming potatoes with said vector at column 9, line 4, hence inherently disclose potato plant cells, plants and harvest products comprising said DNA sequence. Sathasivan *et al* do not teach using imazamox (instant claim 7) in the selection process, but imazamox would have been an obvious analogue of the imazapyr used by Sathasivan *et al* at column 14, 1st paragraph.

Sathasivan *et al* do not teach a heterologous DNA sequence encoding an antisense RNA or a DNA that contains information that causes changes in the carbohydrate concentration and carbohydrate composition of regenerated potato plants.

Edwards *et al* teach transforming a potato plant with a sense or antisense construct of an isoamylase coding region wherein expression of the antisense construct to increase the production of amylopectin type starches, or overexpression of the sense construct to increase the production of amylose type starches (see page 10).

Expression of transgenes, including herbicide resistance transgenes, in *Solanaceae* plants such as tobacco and potato was routine in the instant art at the time

of Applicants' invention. Sathasivan *et al* using tobacco demonstrate that one of ordinary skill in the instant art would have had a reasonable expectation of success in using imidazolinone resistance produced by a mutant AHAS enzyme encoding transgene to select for transformed potato plants. Edwards *et al* teach that those of ordinary skill in the art would have been motivated to combine a selection marker with a sense or antisense construct of the potato isoamylase transgene to modify amylopectin or amylase type starches. Edwards *et al* teach using selectable genetic markers to resistance to imidazolinones at page 21, 2nd paragraph.

Applicants argue that Sathasivan teaches away from selecting the transformed cells using an imidazolinone herbicide but rather uses an antibiotic for selection. Applicants argue that none of the plasmids used in Edwards contain an AHAS selection marker. Applicants argue that the plasmids used in Edwards contain antibiotic resistant genes for selection of transformants. Applicants argue that the pJIT60 plasmid contains the ampicillin resistance gene and the pBIN 19 plasmid contains the PNTII gene. Applicants argue that, either Sathasivan nor Edwards, alone or in combination, disclose selecting for AHA synthase inhibitor resistant cells using an imidazolinone type herbicide as a selection agent without using an antibiotic for selecting transformants as recited in the present claims (paragraph spanning pages 10-11 of the Remarks). These arguments are not found to be persuasive. As directed to claims 8, 9 and 13-19, the teachings of Sathasivan renders obvious these compositions, as the use of a kanamycin resistance selection marker would not obviate the instant rejection. As directed to claims 1-5 and 7, Sathasivan specifically teaches that the mutant gene can

be used as a selection marker in plant transformation systems at column 15, lines12-15 and does not teach away from the claimed method. Applicants' arguments concerning the teachings of Edwards are not found to be persuasive because it is the combination of the teachings of Sathasivan and Edwards that render obvious the instantly claimed invention. One cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

Conclusion

7. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

8. No claims are allowed.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to David H. Kruse, Ph.D. whose telephone number is (571) 272-0799. The examiner can normally be reached on Monday to Friday from 8:00 a.m. to 4:30 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Anne Marie Grunberg can be reached at (571) 272-0975. The central FAX number for official correspondence is 571-273-8300.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group Receptionist whose telephone number is (571) 272-1600.

DAVID H. KRUSE, PH.D.
PRIMARY EXAMINER

David H. Kruse, Ph.D.
26 September 2007

10. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to (571) 272-0547.

Patent applicants with problems or questions regarding electronic images that can be viewed in the Patent Application Information Retrieval system (PAIR) can now contact the USPTO's Patent Electronic Business Center (Patent EBC) for assistance. Representatives are available to answer your questions daily from 6 am to midnight (EST). The toll free number is (866) 217-9197. When calling please have your application serial or patent number, the type of document you are having an image problem with, the number of pages and the specific nature of the problem. The Patent Electronic Business Center will notify applicants of the resolution of the problem within 5-7 business days. Applicants can also check PAIR to confirm that the problem has been corrected. The USPTO's Patent Electronic Business Center is a complete service center supporting all patent business on the Internet. The USPTO's PAIR system provides Internet-based access to patent application status and history information. It also enables applicants to view the scanned images of their own application file folder(s) as well as general patent information available to the public.

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